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(*pattes*) for "legs," and the frequent confusion between genus and family.

Footnotes recording similar work or opposite conclusions would have been valuable, and the lack of an index is especially regrettable.

S. H.

BOTANY.

The Rhodomelaceæ. — Originally planned as one of the series of monographs of the marine organisms of the bay of Naples, the author¹ of this work has extended its scope until now it covers the entire family of the Rhodomelaceæ, as represented in all waters. Of its large quarto pages 109 are given to the general part, covering the anatomical development of the stem, the morphology of the vegetative organs, and the reproductive organs; 588 pages are given to the special part, with detailed studies of all the species found in the Neapolitan region, and of all other species authentic specimens of which were accessible to the author; 248 species are elaborately treated in this part. The third part, "Systematic Results," 34 pages, includes notes on phylogeny, on the relation of the Rhodomelaceæ to other families, and a synoptical view, practically a key to the genera of the Rhodomelaceæ, giving under each genus the names, with descriptions, of the species described in the second part, and of such other species as the author had reason to consider sufficiently studied to leave no doubt of their position under his arrangement. The large genera *Laurencia* and *Polysiphonia* are excepted from this full treatment, only a portion of the species being mentioned, about which the many other species can be grouped; even with this reduction, 320 species are given in this third part.

A monograph of this character, from the hands of the one person competent for the task, is an important event, and the care and thoroughness with which it is done are remarkable. The author undertook the task in 1878, and some of the plates were printed in 1885; after all, this long stretch of time seems none too much for the enormous amount of work involved. What the future may

¹ Falkenberg, R. *Flora und Fauna des Golfes von Neapel*. 26. Monographie. Die Rhodomelaceen. Herausgegeben von der Zoologischen Station zu Neapel. Berlin, 1901. xvi + 754 pp., 24 pls.

bring, no one can tell, but it is difficult to imagine anything that will affect, except in details, so logical and well-grounded a classification as this.

In 1889 Schmitz published his *Systematische Uebersicht der bisher bekannten Gattungen der Florideen*, and in 1897 "The Rhodophyceæ," in Engler and Prantl, *Die Natürlichen Pflanzenfamilien*, was from the manuscript left by Schmitz at his death; in both of these the Rhodomelaceæ were based on Falkenberg's studies, but in both changes were made, with Falkenberg's consent, from his original plan, to conform with Schmitz's general system. In the present work no such change was needed.

The nomenclature of the present work, as compared with J. G. Agardh's, the former standard, shows considerable change. Few new species have been described, and consolidation of existing species has, apparently, at least equaled their division; but the larger genera have been split up, so that the number of new binomials is quite considerable. The increased number of genera seems the result of a logical employment of certain definite characters throughout the family, — monopodial or sympodial growth, radial or dorsiventral character of the frond, endogenous or exogenous character of the regularly distributed branches, presence or absence of "leaves" in addition to the branches, number of pericentral cells, their persistence unchanged or ultimate division, etc. The sexual organs are practically uniform throughout the family, and where the arrangement of the tetraspores appears to offer distinctive characters, it is probably due to the structure of the branches in which they are formed. In conformity with the general algological practice, no attempt has been made to substitute dead and forgotten generic names for long-established ones of later date, but in some cases the older names are given as synonyms; this last may be quite a convenience for persons wishing to attach their names to new binomials, though not familiar with the plants in question.

Many American forms are studied and figured, representatives occurring of the new genera *Brongniartella*, *Bryocladia*, *Dasyopsis*, *Falkenbergia*, *Herposiphonia*, *Heterosiphonia*, *Lophocladia*, *Lophosiphonia*, *Ophidocladus*, *Pterosiphonia* and *Wrightiella*; genera, that is, that may be considered as new, for although most of them appear in Schmitz's papers previously mentioned, they now for the first time are given with full characters and list of species included.

Rhodomela floccosa of our northwest coast is transferred to *Odonthalia*, a very satisfactory place for the luxuriant, pinnately branched

plant of the northern Pacific; but there are other forms passing under this name of quite different habit, for which a place must be found somewhere else. *Polysiphonia bipinnata* Post. and Rupr. is referred to *Pterosiphonia*, but with exclusion of *Polysiphonia californica* Harv., hitherto generally regarded as a synonym. This transfer being based on original material is undoubtedly decisive, but, as in the case of *Rhodomela floccosa*, we are left with a long series of forms, some of which will not go into *Pterosiphonia*. It may be that they can be included in *Polysiphonia californica*, but more study is needed. *Chondria baileyana* Harv. and *C. sedifolia* Harv. are restored to specific rank, but in actual collecting it is not easy to draw the line between the former and what is called *C. tenuissima* on the northeast coast, and between the latter and *C. dasyphylla*.

In regard to the Baltic forms of *Polysiphonia violacea* (Roth) Grev., which Reinke considered identical with *P. harveyi* Bailey and *P. olneyi* Harv. of the American coast, denying autonymy to these two species, the author considers Reinke's identification an error, Harvey's types being amply distinct from the Baltic forms. This is a relief to American algologists, who were about ready, if *P. violacea* and *P. harveyi* were united, to accept one name for all four-tubed *Polysiphonias* whatever. The union under *Rhodomela subfusca* (Woodw.) Ag. of such various forms as *R. lycopodioides* (L.) Ag., *R. virgata* Kjellm., and *R. rochei* Harv. is possible only by giving an extreme range in habit and mode of fruiting. It still seems as if *R. subfusca*, taken in so broad a sense, must be an aggregate, to be divided sooner or later.

A work as thoroughgoing as the present, and starting from the foundations, must continually reach conclusions differing from those of previous writers, and the author states these divergences and contradictions with great frankness; not ill-naturedly, but sometimes apparently with a little impatience with errors which could have been avoided by a little more careful observation. Practically every one who has written on or referred to the *Rhodomelaceæ* comes in for correction sooner or later, most of all the late Professor Agardh, both as the most conspicuous writer and because in spite of, perhaps in consequence of, his remarkable intuitional perception of systematic relations among the algæ, he was never a careful and punctilious student of the development of their structure, and it is upon the development, rather than on the mature structure, that the classification of the present work is based. As compared with the elaborate synonymy of Bornet and Flahault's

monograph of the heterocysted Nostochaceæ, the synonymy here is quite meager; those who are interested in the *ganzen Ballast veralteter Namen aus jener Zeit* are referred to Agardh's, Kutzing's, and Harvey's works. References to standard plates are abundant, but there are practically no references to published exsiccataë, which is often unfortunate; a plate can tell only what the artist saw, or even only what he chose to represent; the plant itself, if in proper condition, is ready to answer questions that never occurred to the artist or the author. The plates in the present work give an instance of this: when a figure is intended to show the position of certain cells, it shows that with the utmost distinctness, but usually nothing more; no indications of thickness of cell walls, character of chromatophores, etc.; where some other character is under consideration, that is given the prominence, to the exclusion or subordination of all others. The plates, however, tell admirably what they undertake to tell; if we were told also where we could find the plant itself, nothing more could be asked. But some remarks by the author as to specimens which belong to several distinct species and appear as autograph authentic specimens of a single species may account for a reluctance to give exsiccataë numbers.

The work is written in a clear and comprehensible style, and now and then contains a graphic expression, which, if not necessary for scientific value, certainly does not detract from it. It would seem that any student, with even a fair knowledge of German, could use the work readily. The ordinary American student, however, will be more likely to borrow the copy of some well-to-do friend than to own one, the price being 120 marks.

Californian Nitophylla.¹—In the historical sketch with which this paper opens, the first reference to Californian Nitophylla is given as "W. H. Harvey, 1858, Pt. II, p. 104, Suppl., p. 128." This is misleading, as Part II of the *Nereis* was published in 1853; Part III, with the supplement, in 1858. Thus the history of Nitophyllum in California dates back five years earlier than given by the author. The latest reference is in 1898, when J. G. Agardh published Vol. III, Part III, of the *Epicrisis* (noticed in the *American Naturalist* for June, 1899), giving fourteen species for the west coast of America. Mr. Nott's careful study of living and dried material, from all parts of the coast, shows that six of these must be

¹Nott, Charles Palmer. Nitophylla of California, Description and Distribution, *Proc. Cal. Acad. Sci.*, Ser. 3, Botany, vol. ii (1901). 62 pp., 9 pls.